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PATENT ABSTRACTS OF JAPAN

(11)Publication number : 11-220703

(43)Date of publication of application : 10.08.1999

(51)Int.Cl.

H04N 7/025

H04N 7/03

H04N 7/035

H04N 5/445

H04N 5/907

H04N 7/20

(21)Application number : 10-019833

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TOSHIBA AVE CO LTD

(22)Date of filing : 30.01.1998

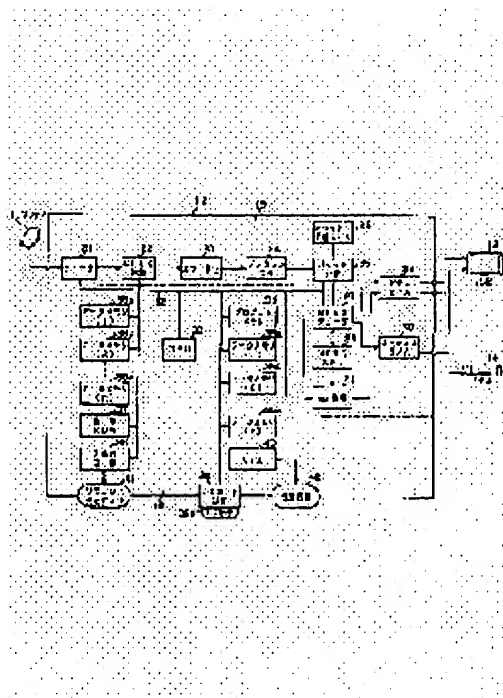
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(54) PROGRAM RETRIEVAL DISPLAY DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To easily recognize a program content fitted for the taste of a viewer by comparing/collating service information following a television program with the viewing taste and the viewing priority of a viewer and displaying a plurality of program display screens on video data of the television program suited to viewing taste and viewing priority and service information in different display sizes, in accordance with the order of viewing priority.

SOLUTION: A CPU 33 reads service information on respective broadcasting channels from a digital signal reproducing part 15 in according with the procedure of a work memory 35a, stores it in a data memory 36a and stores viewing taste data and priorities, which a viewer inputs by the interest/taste input order of the work memory 35b, in a data memory 36b. Service information and viewing taste data are compared/collated in accordance with the processing procedure of the work memory 35c. Service information suited to the taste of the viewer is extracted and is stored in a data memory 36c. Stored service information are arranged in the order high priority by varying the display sizes and they are displayed on a



television 13.

LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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CLAIMS

[Claim(s)]

[Claim 1] A television receiver which carries out reception playback of the TV signal which superimposes and transmits service information which is characterized by providing the following, and which accompanies a TV program A service information storage means which carries out the separation incorporation storage of the service information which accompanies said TV program A viewing-and-listening priority storage means which carries out the setting storage of said TV program's viewing-and-listening taste and viewing-and-listening priority of a viewer A viewing-and-listening program data storage means to carry out comparison collating of said viewing-and-listening taste and viewing-and-listening priority which were memorized for said service information memorized for said service information storage means, and said viewing-and-listening priority storage means, and to memorize said viewing-and-listening taste, image data of said TV program which suited viewing-and-listening priority, and said service information The screen-display size generation means a means generates the program display screen of the display size of said TV program a TV program was memorized by said viewing-and-listening program data-storage means display sizes differ image data and service information according to said viewing-and-listening priority, the program screen-display means a means displays two or more program display screens of the display size said screen-display size generation means generated a display size, and display sizes differ on the screen of a television receiver, and the program selection means a means chooses a viewing-and-listening program from two or more program display screens the display screen was displayed by said program screen-display means

[Claim 2] In a television receiver which carries out reception playback of the TV signal which superimposes and transmits service information which accompanies a TV program A channel selection means to tune in a viewing-and-listening program from said TV signal, and a viewing-and-listening priority storage means which carries out the setting storage of said TV program's viewing-and-listening taste and viewing-and-listening priority of a viewer, A program information reading means to read said program information in a program information record medium which memorized program information which consists of image data and service information at least about said TV program, Comparison collating of said viewing-and-listening taste and viewing-and-listening priority which were memorized for program information read with said program information reading means and said viewing-and-listening priority storage means is carried out. A viewing-and-listening program data storage means to memorize program information which suited said viewing-and-listening taste and viewing-and-listening priority, A screen-display size generation means to generate the program display screen of a display size which is different according to said viewing-and-listening priority in image data and service information on said TV program memorized by said viewing-and-listening program data storage means, A program screen-display means to display two or more program display screens of a different display size generated with said screen-display size generation means on a screen of a television receiver, A program retrieval display characterized by tuning in a viewing-and-listening program which possessed a program selection means to choose a viewing-and-listening program from two or more program display screens displayed by said program screen-display means, and carried out selection specification with said

program selection means from said TV signal with said channel selection means.

[Claim 3] Size of the program display screen generated with said screen size generation means is a program retrieval display according to claim 1 or 2 characterized by arranging so that a stereognostic sense may be given visually while carrying out sequential contraction from highest TV program of said viewing-and-listening priority at low order of said viewing-and-listening priority and indicating by playback on a screen of a television receiver with said program screen-display means at the order of contraction of said program display screen size.

[Claim 4] A program retrieval display according to claim 1 or 2 characterized by classifying into a screen of said television receiver two or more program display screens which indicate by playback according to a program category of the plurality of a TV program, and indicating by playback with said program screen-display means.

[Claim 5] If a program of low order of viewing-and-listening priority is specified in case a viewing-and-listening program is searched with said program selection means on a screen of said television receiver from two or more program display screens which indicated by playback A program retrieval display according to claim 3 or 4 characterized by eliminating a program display of a viewing-and-listening priority high order rather than the assignment program, and moving a display position for a program display of viewing-and-listening priority low order one by one rather than said assignment program and its assignment program, and expanding a display size.

[Claim 6] On a screen of said television receiver, with said program selection means from two or more program display screens which indicated by playback After specifying a program of low order of viewing-and-listening priority for a viewing-and-listening program, In case a program of a viewing-and-listening priority high order is again searched rather than the assignment program, while moving a display position of a program of viewing-and-listening priority low order by which current assignment is carried out and reducing a display size A program retrieval display according to claim 3, 4, or 5 characterized by indicating again the high order program of said viewing-and-listening priority low order program by which current assignment is carried out by playback.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention relates to the method of searching the program according to a viewer's taste promptly, and displaying the searched program out of the program of a large number transmitted by the digital television broadcast system.

[0002]

[Description of the Prior Art] These days, the a large number program by the a large number channel of television broadcasting is promoted using digital television systems. In these digital television systems, many programs are transmitted with the 100 or more numbers of channels using a broadcasting satellite. In case a viewer makes viewing-and-listening selection of the favorite program from the a large number program of this a large number channel transmitted, it is very complicated to discover a favorite program from television race cards, such as a newspaper and a TV program guidebook. On the other hand, although the system based on DVB (Digital Video Broadcasting) specification which digital television broadcast was enacted in Europe is adopted, in this DVB specification, SI (Service Information) data about a program is also transmitted in addition to the image and voice data of a program. Using this SI data, a television receiver generates EPG (program guide displayed on Electronic Program Guide= television screen) data, and the method of carrying out the retrieval channel selection of the favorite program from EPG displayed on the television screen is used.

[0003] However, the program guide by this EPG display Since it is impossible to display all programs on the television screen of the limited viewing area, the limited number of programs is displayed. Indicate the display by sequential scrolling, or Or it is necessary to display on every [of the program included by said SI data] categories (for example, news, a movie, music, a sport, theater, etc.), and to carry out display actuation with the channel selection input means formed in said television receiver, and to search a favorite program.

[0004]

[Problem(s) to be Solved by the Invention] In the digital television system which performs multi-channel broadcast, in case the retrieval channel selection of the favorite program is carried out from the program guide by which it was indicated by EPG on the screen of the television receiver which carries out reception playback of the digital television signal, said EPG display is generated from SI data transmitted along with said program. Said SI data consists of an alphabetic character and numeric data, and the screen consists of an alphabetic character and a numeric character also for said EPG display. For this reason, from the alphabetic character which shows a program, and the numeric character, the viewer read the contents of a program, is doing the retrieval channel selection, and when that program differs from the contents of a program which the viewer imagined after a program channel selection, he needs to do a retrieval channel selection from said EPG display again. For this reason, the technical problem from which the program retrieval and the channel selection by said EPG display become complicated occurred.

[0005] This invention displays the contents of an image of the displayed program on coincidence, and

aims at offering the program retrieval display which makes recognition of the contents of a program easy while it displays only two or more programs which suited a viewer's taste.

[0006]

[Means for Solving the Problem] In a television receiver which carries out reception playback of the TV signal which superimposes and transmits service information which accompanies a TV program A service information storage means which carries out the separation incorporation storage of the service information which accompanies said TV program, A viewing-and-listening priority storage means which carries out the setting storage of said TV program's viewing-and-listening taste and viewing-and-listening priority of a viewer, Comparison collating of said viewing-and-listening taste and viewing-and-listening priority which were memorized for said service information memorized for said service information storage means and said viewing-and-listening priority storage means is carried out. A viewing-and-listening program data storage means to memorize said viewing-and-listening taste, image data of said TV program which suited viewing-and-listening priority, and said service information, A screen-display size generation means to generate the program display screen of a display size which is different according to said viewing-and-listening priority in image data and service information on said TV program memorized by said viewing-and-listening program data storage means, A program screen-display means to display two or more program display screens of a different display size generated with said screen-display size generation means on a screen of a television receiver, It is a program retrieval display possessing a program selection means to choose a viewing-and-listening program from two or more program display screens displayed by said program screen-display means.

[0007]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained to details with reference to a drawing. Drawing 1 is the circuitry block diagram showing the gestalt of 1 operation of the digital television receiver concerning this invention.

[0008] The inside of drawing and a sign 11 are video image transcription recorders which are the antennas which receive the digital television signal transmitted from a broadcasting satellite, and carry out image transcription record of the TV signal which a sign 12 is a set top box for digital television signal regeneration, the sign 13 was reproduced by said set top box 12, it is the analog television receiver which indicates the TV signal changed into the analog signal by playback, and the sign 14 was reproduced by said set top box, and was changed into the analog signal.

[0009] Said set top box 12 is divided roughly into the control microcomputer section (henceforth the control microcomputer section) 16 which controls the digital signal playback section 15 and this digital signal playback section 15.

[0010] The tuner 21 which connected said digital signal playback section 15 to said antenna 11, The QPSK demodulator 22 linked to said tuner 21, and the error correction machine 23 linked to said QPSK demodulator 22, The descrambler 24 linked to said error correction machine 23, and the packet eliminator 25 linked to said descrambler 24, The packet separation memory 26 and the MPEG decoder 27 linked to said packet eliminator 25, The MPEG memory 28, the video signal digital to analog converter (henceforth video D/A) 29, and audio signal digital to analog converter (following.) linked to said MPEG decoder 27 It consists of 30 called audio D/A and a control indicator 31 which connected between said MPEG decoders 27 and said video D/A29.

[0011] The bus circuit 32 which connected said control microcomputer section 16 to the tuner 21, the QPSK demodulator 22, the error correction machine 23, the descrambler 24, the packet eliminator 25, the MPEG decoder 27, and control indicator 31 of said digital signal generation section 15, CPU33 linked to said bus circuit 32, program memory 34, the 1st to n-th work memory 35a-35n, The 1st to n-th data memory 36a-36n, kanji ROM 37, input/output control 38, the IC card control 39, and modem 40, It consists of the remote control and a display panel 41 linked to said input/output control 38 (henceforth remote control and a display panel), and the telephone line 42 linked to said modem 40.

[0012] Although the various devices which constitute said digital signal playback section 15 already perform a well-known function and actuation and details explanation reduces a labor, said antenna 11 receives, the digital television signal changed into the intermediate frequency is supplied to said tuner

21, and a viewer's favorite channel tunes it in, and it is changed into baseband signaling. It gets over to digital data with said QPSK demodulator 22, and said baseband signaling is supplied to the error correction machine 23. This error correction machine 23 classifies the digital data to which it restored for every packet, and supplies it to a descrambler 24 as transport stream data while it performs the error detection and the error correction of said digital data. When the transmitted signal is enciphered, this descrambler 24 restores decryption to the signal of deed origin, and supplies it to the packet eliminator 25. This packet eliminator 25 separates the image data of the program transmitted from said transport stream data, voice data, and the various information data that accompanies a program for every packet according to the packet separation procedure memorized by said packet separation memory 26. Each packet data separated with said packet eliminator 25 is supplied MPEG decoder 27. According to the means memorized by said MPEG memory 28, decode processing of this MPEG decoder 27 is carried out. The video signal by which MPEG decode was carried out is video D/A29, and a sound signal is changed into an analog signal from a digital signal by audio D/A30, and is outputted to the analog television receiver 13 and the analog video image transcription record device 14. Said video signal decoded by said MPEG decoder 27 carries out the output control of the video output to said video D/A29 with a control indicator 31 according to the display format in which the viewer did the demand input. As a concrete good example, in performing an EPG display on the screen of said analog television receiver 13, the program data separated from SI data which is the program accompanying information in said digital television signal with the EPG display format is displayed from said control indicator 31, or it displays SI data about the program on the video signal of a program in piles.

[0013] Said control microcomputer section 16 performs EPG display which processes said digital signal playback section 15 efficiently, and a viewer demands, and graphic display of a program through said bus circuit 32 according to the procedure memorized by the real-time OS carried in CPU33, and program memory 34. The n-th work memory 35a-35n is making the generation procedure of the display format for every display gestalt of the image displayed on the screen of said analog television receiver 13 memorize from said 1st [the] of this control microcomputer section 16. Said the 1st to n-th data memory 36a-36n is the memory which memorizes the data according to a said work memory [35a-35n] display gestalt, and said kanji ROM 37 has memorized the alphabetic data which generates the alphanumeric displayed on television screen-ization from SI data which accompanies the program included with the image and sound signal of a program of said digital television signal. Said input/output control 38 is the remote control input means of remote control and a display panel 41, and a viewer incorporates the input data which carried out the actuation input to said microcomputer control section 16, or it has the output supply function which controls the action indication panel prepared in said set top box 12. Furthermore, when the program which received with said antenna 11 and was tuned in with said tuner 12 is enciphered and transmitted, while reading a viewer number, a decryption key, etc. which are memorized by IC card 39a and performing collating with the decryption authorization conditions in a transmission signal by said IC card control 39, a decryption key is supplied to said descrambler 24. In case said modem 40 receives charged broadcast, it is for transmitting accounting information to a program provider using the telephone line 42.

[0014] In case EPG is first created in the set top box 12 of such a configuration and actuation from SI data which accompanies said each program Supposing SI data incorporation and an EPG creation procedure are memorized by said 1st work memory 35a By the EPG display input from said remote control and display panel 41 of a viewer According to the procedure of said 1st work memory 35a, said digital signal playback section 15 is controlled from said CPU33. Read SI data by which superposition transmission is carried out to each broadcast channel, and it memorizes to said 1st data memory 36a. And based on the data memorized by the 1st data memory 36a, the alphabetic data from said kanji ROM 37 is used, and it indicates by EPG through said MPEG decoder 27 and display control 31 at the analog television receiver 13.

[0015] On the other hand, the viewer of program taste is various by age, sex, and hobby taste for every individual. For this reason, while transmitting a program which is different from the broadcast signal exceeding 100 channels in a broadcast time zone, discovering the program suitable for taste from said

EPG display requires much time amount from from. Then, 2nd work memory 35b is made to create and memorize a viewer's age, sex, and the procedure that inputs hobby taste. For example, a question type is displayed on the screen of said analog television receiver 13, and the click input of a viewer's applicable item is carried out with remote control or an input means according to the question display. especially, under the hobby and taste matter of a question item, in case the taste of a movie be ask, the work country a Japanese film and oil painting exception, a present age, time, and melodrama musical play exception, and in the case of oil painting etc. set up like an item [of a sport], in and outside the country, and pro flax exception, so that a viewer may be fond and it can input for every category of a program, or genre, in case the taste of a sport be ask. A viewer's viewing-and-listening taste data is memorized to said 2nd data memory 36b with the hobby taste input procedure of the viewer of said 2nd work memory 35b.

[0016] Next, the processing procedure which said 3rd work memory 35c prestored is followed with the input directions from said remote control and display panel 41. Comparison collating of the viewer taste data memorized by SI data of each channel memorized by said 1st data memory 36a and said 2nd data memory 36b is carried out. A screen display is carried out, while extracting SI data which suited a viewer's taste and memorizing to 3rd data memory 36c. Consequently, since only the program which suited a viewer's taste is displayed, retrieval and a channel selection of a viewing-and-listening program become easy. Furthermore, a viewing-and-listening channel selection of a viewer becomes still easier by giving priority to this taste. Moreover, the range of the select data of the program which a viewer likes with the taste data which the viewer inputted when said 2nd data memory 36b was made to also memorize the channel selection program data of a viewer's past becomes expandable. Thus, it is arranged and SI data which suited a viewer's taste memorized by said 3rd data memory 36c is memorized, as shown in drawing 2.

[0017] That is, drawing 2 (a) is arranged in order of the taste according to program category (henceforth the order of viewing-and-listening priority). Drawing 2 (b) is what arranged the program name for the sports program of a program category in order of viewing-and-listening priority, and drawing 2 (c) arranges a program name for the movie program of a program category in order of viewing-and-listening priority.

[0018] Although the channel number, a channel name, a program name, program time, start time, end time, etc. of a program are conventionally displayed according to a display format in order of said viewing-and-listening ranking of current time in case it indicates by EPG from such program category viewing-and-listening ranking data, generally, there is most format of a table and this display format is used.

[0019] However, in the display of said table format, although the contents of the program are recognized from a program name, neither theater nor a movie can especially perform contents grasp enough only by the program name. Therefore, this invention offers the EPG display as which a viewer can grasp the contents of a program enough.

[0020] Specifically, it explains using the example of a screen display of the television receiver shown in drawing 3. The sign 50 in drawing shows the television screen. this -- television -- a screen -- 50 -- **** -- five -- a piece -- a program -- a category -- a field -- V -- W -- X -- Y -- Z -- a boundary line -- V -- ' -- W -- ' -- X -- ' -- Y -- ' -- Z -- ' -- classifying -- having -- ****.

[0021] in the center of the television screen 50, the program display 51 of "professional baseball" of the 1st place arranges [viewing-and-listening priority] for the "sports" of a category with the highest viewing-and-listening priority -- having -- the field V of the upper left direction of this program display 51 to a screen -- the center from the outside of a screen -- going -- the order of viewing-and-listening priority -- and it displays, reducing a screen product. That is, the program display 52 of the 2nd place of viewing-and-listening priority, the program display 53 of the 3rd place of viewing-and-listening priority, and the program display 54 of the 4th place of viewing-and-listening priority are arranged for "sports" at the upper left direction of Field V. The screen product of the program display 51 of the 1st place of said viewing-and-listening priority is compared with other program displays, and is enlarged most, and consists of image 51e of channel number 51a, channel name 51b, program name 51c, program initiation

time, 51d of end time, and its program as contents of a display. Next, the program display 52 of the 2nd place of viewing-and-listening priority is a screen product smaller than the program display 51 of the 1st place of said viewing-and-listening priority. Like the program display of the 1st place of said viewing-and-listening priority, while performing the display about the program and displaying the same contents of a display hereafter also about the program displays 53 and 54 of the 3rd place of viewing-and-listening priority, and the 4th place, the contents of a display The program screen product of the 3rd place of viewing-and-listening priority is giving an arrangement indication of the area of the abbreviation one half of the program display 52 of the 2nd place of said viewing-and-listening priority, and the program screen product of the 4th place of viewing-and-listening priority so that it may become the area of the abbreviation one half of the program display 53 of the 3rd place of said viewing-and-listening priority.

[0022] Next, the program category of a movie is displayed on viewing areas W and X. An arrangement indication of the program display 55 of the 1st place of the viewing-and-listening priority of a Japanese film and the program display 56 of the 2nd place of viewing-and-listening priority is given to Field W among this movie category. An arrangement indication of the program display 57 of the 1st place of the viewing-and-listening priority of oil painting, the program display 58 of the 2nd place of viewing-and-listening priority, and the program display 59 of the 3rd place of viewing-and-listening priority is given at the viewing area X. If a program with the highest priority considers the screen product of these program displays 55-59 as the program display 57 of oil painting for example, by the movie program category, and the following priority considers as the program display 55 of a Japanese film and considers priority as the program displays 58, 56, and 59 below The boundary lines X1 and X2 which display each program display small one by one from said program display 57, and classify said priority are established, and it is made still easier [distinction].

[0023] A program category is set as other viewing areas Y and Z, and it is indicated by the program according to the viewing-and-listening priority of the program for every category of the.

[0024] In the EPG display of such a display format, in case the viewing-and-listening channel selection of the program of the program display 51 with the highest viewing-and-listening priority is carried out, if said television screen 50 carries out a selection cursor advance and a channel selection click is carried out on the program display 51 using the remote control input means of the remote control and the display panel 41 of said set top box 12, the program of the program display 51 will be tuned in, an EPG display is eliminated, and said television screen is changed to the program graphic display of the program display 51. Temporarily, in case a program for a viewer to judge that does not view and listen from the contents of a display of the program display 51 of the 1st place of priority and image 51e, and view and listen from programs other than this program is chosen If a cursor advance is carried out to the program display 52 of the 2nd place of the following viewing-and-listening ranking and a program display expansion actuation input is carried out The program display 51 of the 1st place of said priority is eliminated, and the program display 52 of the 2nd place of said priority moves. An enlarged display is carried out in the display position of the program display 51 of the 1st place of said priority. The program display 53 of the 3rd place of said priority in the location of the program display 52 of the 2nd place of said priority The program display of the priority 5 as which sequential migration expansion was carried out in the location of the program display 53 of said priority 3, and the program display 54 of the 4th place of said priority was not displayed on the program display 54 of the 4th place of said priority is newly displayed. Furthermore, in case a channel selection program is chosen from the oil painting of Field X, the program display of the priority 1 of said oil painting may be moved to the location of said program display 51 with the highest priority, or migration expansion of the program display 58 of the 2nd place of the priority of the program of oil painting may be carried out in the location of the program display 57 of the 1st place of oil-painting priority.

[0025] Since retrieval of the contents of a program is attained from the high program of two or more program displays displayed on the television screen 50 to viewing-and-listening priority to a program with a low priority one by one by this, and the display which shows the contents of a program is expanded at the time of retrieval and a program image is also displayed, grasp of the contents of a

program becomes easy. Furthermore, the program display screen which has a cubic effect visually so that the program display which suited in the distance (small size) may approach one by one and may be expanded is generable as each program display for program retrieval changes a display size in the high order of priority, arranges in it and advances program retrieval to it. Therefore, the program channel selection with the play heart is attained to a viewer.

[0026] The program display of this television screen is added to SI data which accompanies said program, and the image which corresponds to that program as mentioned above also shows it to coincidence. According to the processing procedure which 4th work memory 35d prestores, this graphic display performs incorporation processing for the program image data of each channel, and incorporates the 4th data memory 36d program image data as still picture data. It is made to superimpose on this data memory 36d [4th] still picture data and the viewer taste adaptation SI data of said 3rd data memory 36c, and it becomes possible to display on said television screen 50 by the radical of viewing-and-listening priority. Moreover, since the image of each program display displayed on said television screen 50 by incorporating the image data of each program incorporated to said 4th data memory 36d with a predetermined time interval, and replacing data with can be made into the image which has a motion intermittently and can display the image at the on-going present time of a program, it serves as effective judgment information on a program channel selection.

[0027] Although a setup of the screen-display format of a program display and a screen product displayed on the above-mentioned television screen 50 is performed by the display control 31 of said set top box 12, the details configuration of this display control 31 is realizable by using the logical circuit shown in drawing 4.

[0028] The sign 61 of drawing 4 is an input terminal, and the image data by which MPEG decoding was carried out by said MPEG DEKOTA 27 is supplied. The image data supplied to said input terminal 61 is memorized by memory 62. The output of the level counter 63 which operates on the other hand with the level clock signal according to the Horizontal Synchronizing signal from a horizontal synchronization driver with which said set top box 12 or the analog television receiver 13 is not illustrated, and this level counter 63 is supplied to one input terminal of the level comparator 64, and the output from the level reading appearance dehiscence opening rate circuit 65 of said memory 62 is supplied to the input terminal of another side of this level comparator 64. The output of said level comparator 64 is supplied also to the level size counter 67, one input terminal of perpendicular NAND circuit 74, the water Hirama length circuit 78, and the perpendicular infanticide circuit 79 while a level read-out signal is supplied to one input terminal of level AND circuit 66, when the clock of said level counter 63 and the position signal from said level reading appearance dehiscence opening rate circuit 65 are in agreement. The output of said level AND circuit 66 supplies the reset signal for image data read-out to said memory 62. The output of said level size counter 67 is supplied to one input terminal of a comparator 68, the size signal from the level size signal generation machine 69 is supplied to the input terminal of another side of this comparator 68, and the output of this comparator 68 is further supplied to one input terminal and said level size counter 67 of AND circuit 70. The output of this AND circuit 70 is supplied as an enable signal of said memory 62.

[0029] Next, the output of the perpendicular counter 71 which operates with the perpendicular clock signal according to the Vertical Synchronizing signal from a vertical-synchronization driver with which said set top box 12 or the analog television receiver 13 is not illustrated, and this perpendicular counter 71 is supplied to one input terminal of the perpendicular comparator 72, and the output from the perpendicular reading appearance dehiscence opening rate circuit 73 of said memory 62 is supplied to the input terminal of another side of this perpendicular comparator 72. When the clock of said perpendicular counter 71 and the signal from said perpendicular reading appearance dehiscence opening rate circuit 73 are in agreement by said perpendicular comparator 72, a perpendicular read-out signal is supplied to the perpendicular size counter 75. The output of this perpendicular comparator 72 is connected with the input terminal of another side of said level AND circuit 66 in the perpendicular infanticide circuit 79. The output of said perpendicular NAND circuit 74 is connected to the input terminal of another side of said perpendicular size counter 75, an output terminal is connected to one

input terminal of a comparator 76, the perpendicular size signal generation machine 77 is connected to the input terminal of another side of said comparator 76, and the output terminal of said comparator 76 is connected to the input terminal of another side of said AND circuit 70 and said perpendicular NAND circuit 74. The output of said water HIRAMA length circuit 78 and perpendicular infanticide circuit 79 is connected to each input terminal of AND circuit 80. The output of said memory 62 is connected to buffer memory 81. The output of said AND circuits 66 and 80 is connected, and said buffer memory 81 performs data write-in reset from said memory 62 with the output of said level AND circuit 66, and performs write-in enabling [of said buffer memory 81] with the output of said AND circuit 80.

[0030] Next, the output of said level AND circuit 66 is further connected also to the level counter 82. The output of this level counter 82 is connected to one input terminal of a comparator 83. The output of a counter 84 is connected to the input terminal of another side of said comparator 83, and the level read-out starting position initial value circuit 85 is connected to the input of this counter 84. The output of said perpendicular comparator 72 is connected also to the perpendicular counter 86. The output of this perpendicular counter 86 is connected to one input terminal of a comparator 87, output connection of the counter 88 is carried out to the input terminal of another side of said comparator 87, and the perpendicular read-out starting position initial value circuit 89 is connected to the input of this counter 88. The output of said comparator 83 is connected to one input terminal of AND circuit 90, and the output of said comparator 87 is connected to the input terminal of another side of said AND circuit 90. The output of this AND circuit 90 supplies the initial value reset signal of the read-out starting position of the image data memorized to said buffer memory 81. Furthermore, the output of said comparator 83 is connected to one input terminal of the RSF/F circuit 91, and the counter 92 and the level read-out size initial value circuit 93 are connected to other input terminals of said RSF/F circuit 91 at the serial. The output of said comparator 87 is connected to one input terminal of the RSF/F circuit 94 while connecting with the input terminal of another side of said AND circuit 90. As for the input terminal of another side of said RSF/F circuit 94, the counter 95 and the perpendicular read-out size initial value circuit 96 are connected to the serial. The output of said RSF/F circuits 91 and 94 is connected to the input terminal of AND circuit 97, respectively, and the output of this AND circuit 97 is supplied as an enable signal for every size of the read-out image data of said buffer memory 81. The output of said buffer memory 81 outputs image data to video D/A29 of said set top box 12 from an output terminal 98.

[0031] In the logical circuit of such a configuration, the level perpendicular reading appearance dehiscence opening rate reset signal from said level counter 63, said level reading appearance dehiscence opening rate circuit 65 and said perpendicular counter 71, and the perpendicular reading appearance dehiscence opening rate circuit 73 is generated. The read-out starting position of the image data memorized by said memory 62 is reset. Further with the size data from the level size signal generation machine 69 and the perpendicular size signal generation machine 77 A level perpendicular read-out period enable signal is generated from said AND circuit 70, and the image data of said memory 62 is transmitted to said buffer memory 81. Said buffer memory 81 writes in and resets the image data transmitted from said memory 62, and writes in the period aforementioned video signal of the write-in enable signal which is generated in said water HIRAMA length circuit 78 and said perpendicular infanticide circuit 79, and is outputted from said AND circuit 80. The video signal written in said buffer memory 81 It generates in said level counter 82, said level read-out starting position initial value circuit 85 and the perpendicular counter 86, and the perpendicular read-out starting position initial value circuit 89. By the read-out location reset signal from said AND circuit 90 The image data read-out location from said buffer memory 81 is reset. It generates in said level read-out size initial value circuit 93 and the perpendicular read-out size initial value circuit 96, the period image data of the read-out enable signal from said AND circuit 97 is read, and said video D/A29 is supplied from said output terminal 98.

[0032] That is, the size of the image amount of data which transmits the image data incorporated by said memory 62 from said input terminal 61 with said level size counter 67 and said perpendicular size counter 75 to said buffer memory 81 is set up. That is, the size (for example, program display 51 of drawing 3) which displays the highest program of the viewing-and-listening priority explained by

drawing 3 is made to carry out the transfer storage of the image and SI data which indicate by EPG from said memory 62 at buffer memory 81.

[0033] In case transfer storage is carried out from this memory 62 at said buffer memory 81, the rate of infanticide of a level perpendicular direction is set up in said water HIRAMA length circuit 78 and said perpendicular infanticide circuit 79 for every magnitude of a program display size, and it incorporates and memorizes from said memory 62 to said buffer memory 81 according to that rate of infanticide. That is, if the display size of the program display 52 of drawing 3 sets to one half of the display sizes of said program display 51, in case the image and SI data of said program display 52 will be incorporated and memorized to said buffer memory 81, from said horizontal and perpendicular infanticide circuits 78 and 79, a perpendicular carries out thinning-out control to it being level every $[2 / 1]$, and it incorporates, and memorizes.

[0034] If actuation of this infanticide is explained using drawing 5, said image memorized by said memory 62 and SI data will presuppose that the data of all the grids of the horizontal axis dX and axis of ordinate dY which are shown in drawing 5 (a) is memorized. A horizontal and a perpendicular read the data (W11-W77 show among drawing) of every other measure in the data memorized in this memory 62, and it incorporates and memorizes to said buffer memory 81. In addition, the example of operation at the time of thinning out 1/3 is shown in drawing 6 to the level perpendicular direction, and the inside W11-W45 of drawing is data read and memorized to buffer memory 81.

[0035] Next, with said data read-out starting position signal set up in the perpendicular read-out starting position initial value circuits 85 and 89 as it is level, and said data read-out period signal set up in the perpendicular read-out size initial value circuits 93 and 96 as it is level, the data incorporated and memorized to said buffer memory 61 performs data read-out, as shown in drawing 5 (b) and drawing 6 (b). Consequently, one third of the data of the data which one half of the data of the data incorporated and memorized by said memory 62 was outputted to said output terminal 98, and drawing 5 (b) incorporated drawing 6 (b) by said memory 62, and was memorized is outputted to said output terminal.

[0036] Thus, modification of a program display size also becomes possible by a setup of as another program display size as said viewing-and-listening priority being attained, and thinning out for every program data, and making a rate adjustable by thinning out and processing the program indicative data displayed on said television screen 50 according to a display size.

[0037] In addition, the counters 84 and 88 connected to said horizontal and perpendicular read-out read-out location initial value circuits 85 and 89 are for changing into the television screen 50 the display position of each program display which indicates by playback. Moreover, the counters 92 and 95 connected to said horizontal and perpendicular read-out size initial value circuits 93 and 96 are for changing into the television screen 50 the display size of each program display which indicates by playback. That is, when the program display 52 of the 2nd place of viewing-and-listening priority other than program display of the 1st place of viewing-and-listening priority 51 is specified that it explained using drawing 3, the program display 51 of the 1st place of said ranking was eliminated, and the program display 52 of the 32nd place of said ranking was moved to the program display position of the 1st place of said ranking, and display screen size is expanded. Said counters 84, 88, 92, and 95 perform change of this program display position and a display size.

[0038] Next, other operation gestalten of this invention are explained. As for the program currently conventionally introduced with the newspaper, the TV program magazine, etc., it is possible to edit into CDV-ROM or DVD-ROM, and to also make the main program image data of each program include. This program image data is included and a program display and a search method are explained using CDV-ROM or DVD-ROM (henceforth program data medium).

[0039] The data reading procedure currently recorded on work memory 35n of ** a n-th of said set top box 12 by said program data medium is made to memorize in advance, and let data memory 36n of ** a n-th be said program data medium. Program data is read in said data memory 36n [of ** a n-th] program data medium with said n-th work memory 35n procedure. Furthermore, by performing comparison collating with the taste data of the viewer of said 3rd work memory 35c, and making said 3rd data memory 36c memorize the comparison collating result According to a viewer's viewing-and-

listening priority, the program display recorded on said television screen 50 by said program data medium in order of a taste program category exception or viewing-and-listening priority is attained.

[0040] Moreover, since the program data with which said program data medium is recorded can record the data for several weeks from one week, a program reservation channel selection and the image transcription record of it are also attained from program initiation time data.

[0041] Although the above-mentioned explanation of this invention explained the set top box which carries out reception playback of the digital television signal, television imagery, voice, and SI data as a different device from the television receiver which indicates by playback, it is possible to consider as the television receiver which contained said set TOBBU box in the television receiver.

[0042] Moreover, although the above-mentioned explanation explained that it was searched by low order from the high order of viewing-and-listening ranking from two or more program displays currently displayed on the television screen In case a viewer searches again the program of a viewing-and-listening ranking high order during program selection retrieval If a return retrieval input is performed using said retrieval input means, it is possible also in displaying again the program display of the viewing-and-listening ranking high order of the program display by which performed the display-position migration and display-size contraction of a program display of viewing-and-listening ranking by which it is indicated by current, and display-size contraction was carried out with the display-position migration.

[0043]

[Effect of the Invention] While contents grasp of a viewing-and-listening channel selection program can do this invention easily from said image data and SI data by extracting the image data and SI data of a program which suited a viewer's taste, and displaying on a television screen In case the image data and SI data of a program which were extracted are displayed on said television screen While the channel selection of the program of liking [a viewer] is easily attained by carrying out sequential contraction of the program display screen size from the high program of viewing-and-listening priority at the low order of priority, and displaying on said television screen according to distribution or a program category At the time of the program retrieval which wishes to view and listen, it has the effect program retrieval and whose channel selection are attained with three-dimensional vision sensation and game sensation by carrying out the enlarged display of the program display with a low sequential viewing-and-listening priority.

[Translation done.]

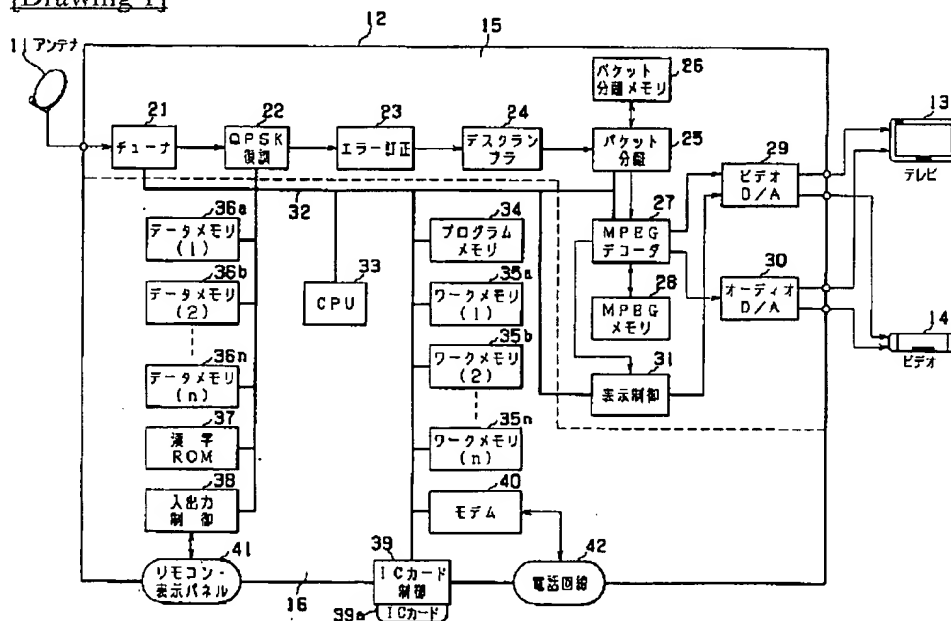
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DRAWINGS

[Drawing 1]



[Drawing 2]

(a)

番組カテゴリー優先順位	
優先順位	番組カテゴリー
1	スポーツ
2	映画
3	音楽
⋮	
n	N

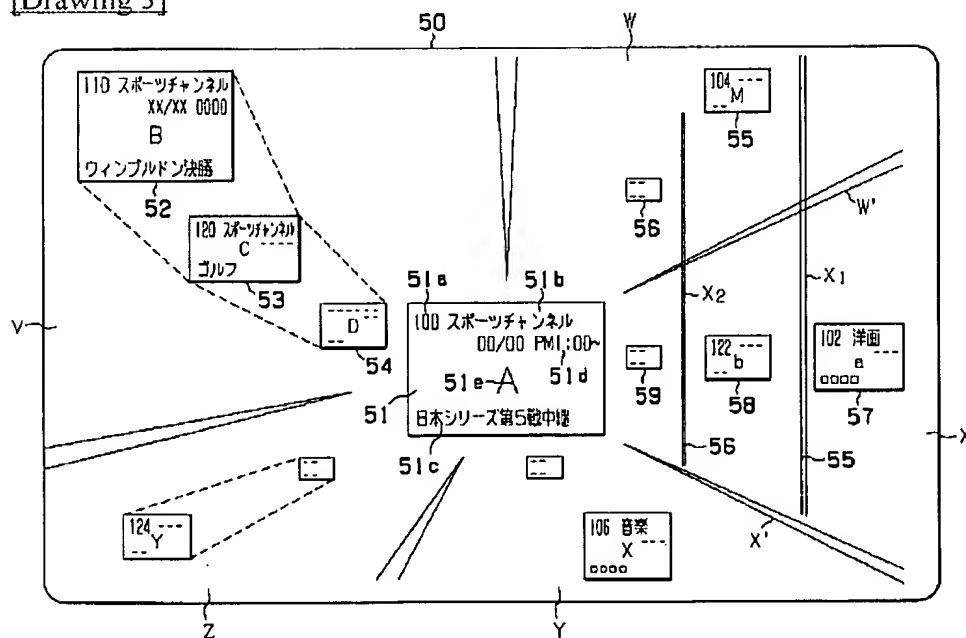
(b)

番組カテゴリー：スポーツ優先順位	
優先順位	番組名
1	プロ野球
2	サッカー
3	ゴルフ
⋮	
n	N

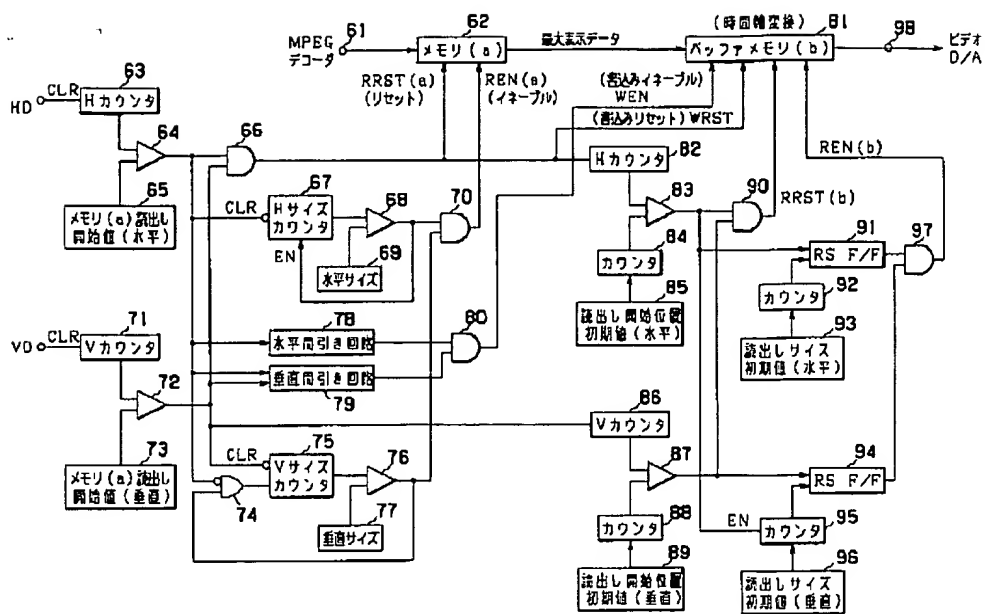
(c)

番組カテゴリー：映画優先順位	
優先順位	番組名
1	洋画 西部劇
2	洋画 ミュージカル
3	邦画 時代劇
⋮	
n	N

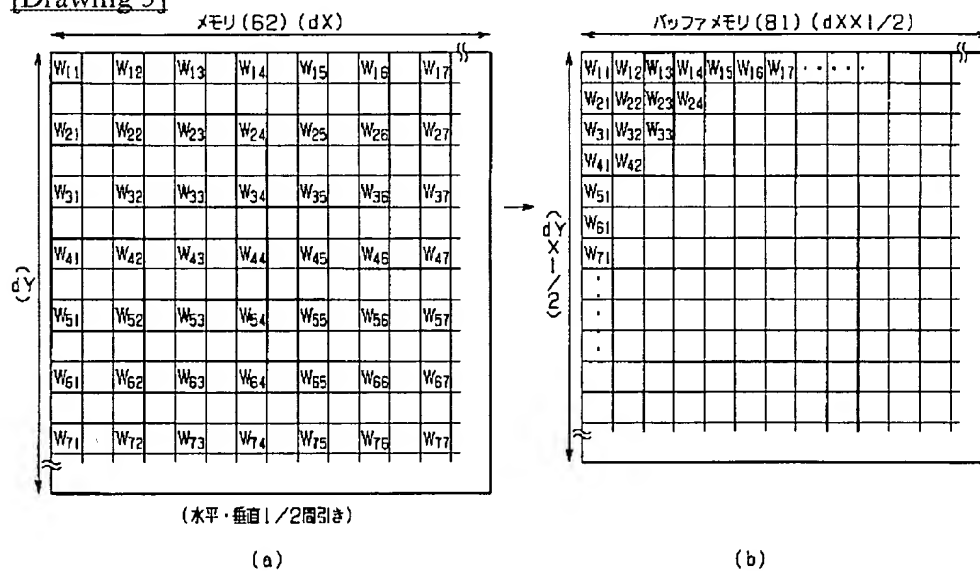
[Drawing 3]



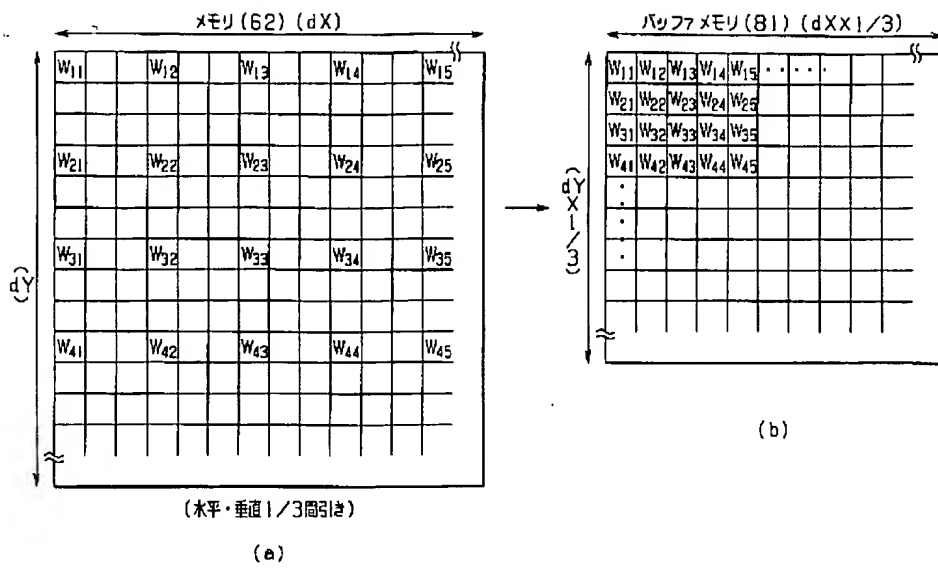
[Drawing 4]



[Drawing 5]



[Drawing 6]



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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The circuitry block diagram showing the gestalt of 1 operation of the digital television receiver concerning this invention.

[Drawing 2] The plan showing the memory storage condition of using for explanation of this invention.

[Drawing 3] The plan showing the television screen-display gestalt of this invention.

[Drawing 4] The logical circuit block diagram which generates the television screen-display gestalt of this invention.

[Drawing 5] The plan explaining the screen contraction displayed on the television screen of this invention.

[Drawing 6] The plan explaining the screen contraction displayed on the television screen of this invention.

[Description of Notations]

11 -- An antenna, 12 -- A set top box, 13 -- Analog television receiver, 14 -- A video image transcription recorder, 15 -- The digital signal playback section, 16 -- Control microcomputer section, 21 [-- DESURAMBURA,] -- A tuner, 22 -- A QPSK demodulator, 23 -- An error correction machine, 24 25 -- A packet eliminator, 26 -- Packet separation memory, 27 -- MPEG decoder, 28 -- MPEG memory, 29 -- Video D/A, 30 -- Audio D/A, 31 [-- Program memory, 35 / -- Work memory, 36 / -- Data memory, 37 / -- A kanji ROM, 38 / -- Input/output control, 39 / -- IC card control, 40 / -- A modem, 41 / -- Remote control and a display panel 42 / -- Telephone line.] -- A control indicator, 32 -- A bus circuit, 33 -- CPU, 34

[Translation done.]